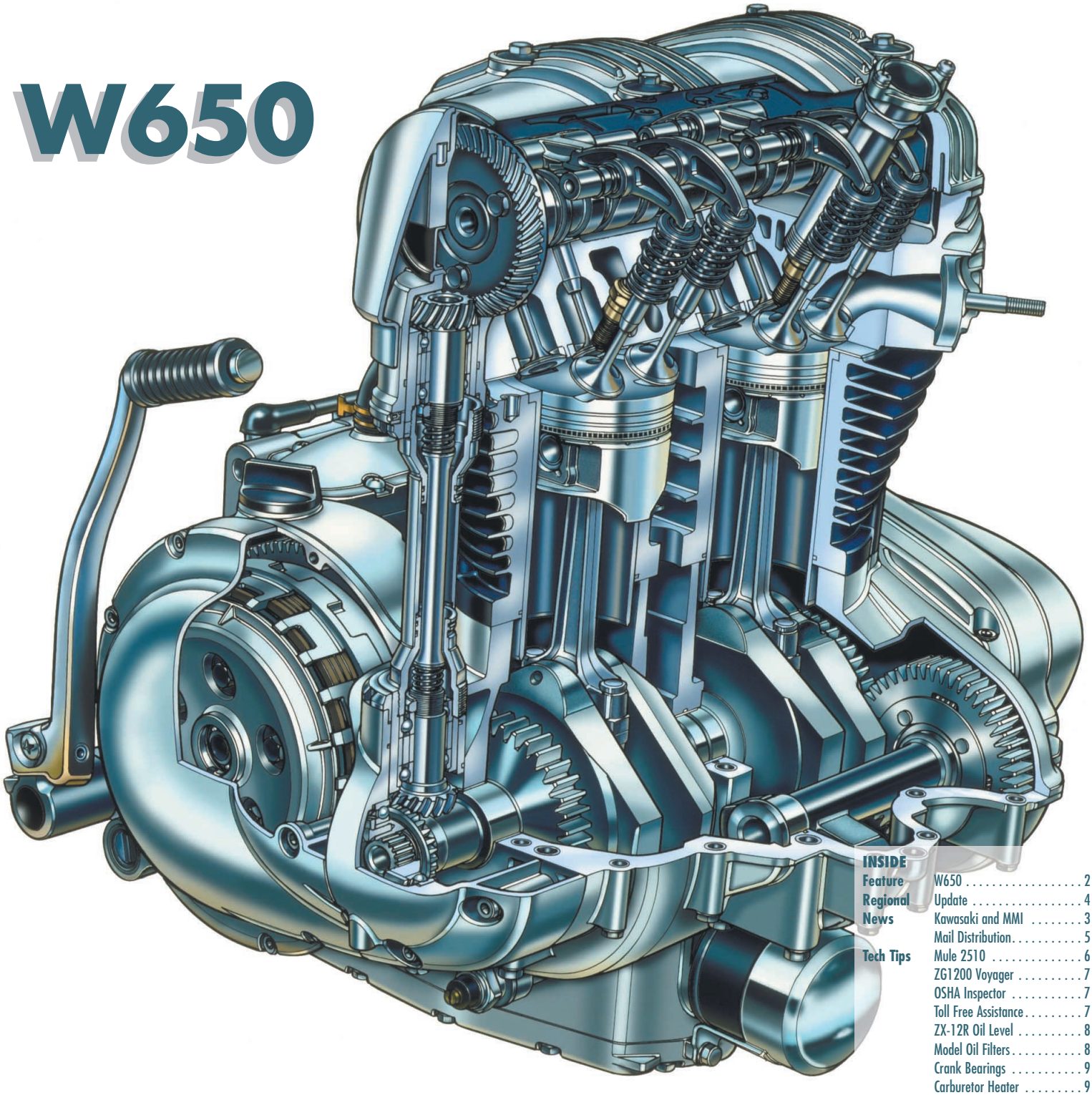
K-TECH NEWS

SPRING 2000 THE **KAWASAKI** TECHNICAL MAGAZINE VOL. 13, NO. 1

W650



The All-New W650

by John Griffin
Instructional
Designer/Instructor

W650

Kawasaki has turned back the time machine again to come up with the all-new W650. It is a real head-turner, in fact, besides the ZX-12R, it is probably the most visited Kawasaki product at the motorcycle shows. The ride is as good as the looks with strong power from idle to the 7,750 rpm red line, a pleasing exhaust note, easy handling, and a comfortable upright seating position.

Engine

The air-cooled 675cc vertical twin features four valves per cylinder and a single gear-driven camshaft. The engine is a wet sump design, so there are no separate oil tanks. Both pistons rise and fall together with the 360° design crankshaft, although they fire on opposite rotations. The result is a power pulse every 360° of crankshaft rotation.

A counter-rotating balancer shaft drives off the left end of the crankshaft with a scissor gear for quiet operation. It swings a single counterweight positioned between the cylinders for minimal vibration.

Contemporary technology includes the K-TRIC system, rare-earth magnets, and oil jet lubrication. The K-TRIC system ties a throttle sensor to the ignition to vary timing with throttle settings as well as engine RPM for better response and fuel economy. Lightweight neodymium magnets in the flywheel let the engine rev quicker. Both connecting rods have an oil jet to spray and cool the bottom of the pistons, which is important with the air-cooled engine.

Bevel Gear-Driven Camshaft

The most unique feature of the W650 engine is the hypoid, bevel gears

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K-TECH News

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***K-TECH News* Staff**

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Kawasaki Tech Services

Publications Manager
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Piscataway/Grand Rapids
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David Behlings, Tom Dahl, Alex Dell, Nate DePauw, Mary Joseph, Chris Reo, Rick Roddewig, Ray St. John

Graphics/Production

Graphic Art
Gregg Thompson

Photography
John Griffin

Production
Holland Marketing Services

Published by Kawasaki

Kawasaki and MMI Join Forces

by Tom Dahl and Chris Reo
K-Tech Specialist Chief Instructors

January 1997 marked the premiere of Motorcycle Mechanics Institute's K-Tech Specialist program, led by Tom Dahl, Chief Instructor at the Phoenix campus. The K-Tech Specialist program is a six-week elective, which is fully endorsed and equipped by Kawasaki Motors Corp. It is an entry-level course based on factory programs offered to dealership employees by the manufacturer. As of August 1999, the program is also offered at MMI's Orlando campus, and led by Instructor Chris Reo.

Throughout MMI's 33 week Motorcycle Technician Program (MTP), students learn general motorcycle repair procedures on a variety of brands and models. Upon successful completion of the MTP, students have the option of attending brand specific elective programs to sharpen their skills and continue their education with a particular product line. Students attending the K-Tech Specialist program are trained using Kawasaki's procedures, including the KIC and K-SHARE programs to simulate the dealership atmosphere.

The first four weeks of the program focus on current model year motorcycle products. Students receive instruction and perform hands-on workstations for an assortment of procedures. Before receiving a certificate, students will be able to correctly perform: shim over, shim under, and screw and lock nut valve adjustments; v-twin engine R&R and rebuild; carburetor service; brake service; coolant service; safety inspections; and various electrical tests. Additionally, students participate in the Team Green course which is similar to courses currently offered to dealership technicians in the field. At the end of this section, students will be able to correctly perform: front fork and rear shock rebuild and set-up; KIPS valve system timing; and a two stroke leak down test.

The fifth week of the program introduces the student to Kawasaki's ATV and Mule products. During this week, students learn: unit assembly and preparation for retail sale; rear differential removal and replacement; and CVT system diagnosis and repair. The CVT system workstation requires the student to correctly remove, rebuild, measure and determine all wear points in the unit.

The sixth week of the program introduces the student to Kawasaki's watercraft line. Upon successful completion of the course, students will be able to correctly remove and rebuild an engine and pump. Some of the more basic procedures include: assembly and preparation; carburetor service; electrical testing, including trim systems; cooling and bilge system diagnosis and repair.

Throughout the pro-

Cont'd - page 5

K-TECH Specialist
Motorcycle Mechanics Institute

Need Trained Technicians?

MMI has been training technicians since 1973. We place great emphasis on assisting graduates to find the right job, while also assisting dealerships to find the right technician. We graduate approximately 250 entry level technicians per year. Due to our scheduling, graduation occurs every six weeks. Dealers who are interested in hiring our grads may call the Phoenix campus at (800) 869-9644, ext. 1320 or 1362, or the Orlando campus at (800) 342-9253, ext. 1105. An employment advisor will place an ad in our job opening list which is given to each upcoming graduate as well as any past grad looking for a job. Your ads should tell as much as possible about the shop; size, location (large or small town), recreation in the area, cost of living—anything to attract attention and interest. While most young grads return to their hometowns, an informative listing may get their attention. When a student is interested, the advisor will send you a resume and transcripts, giving you a call to let you know as much information as we can about the tech. If you are interested, we will have the student call for a phone interview.—*Mary Joseph, Director, Employment Services*

PISCATAWAY/ GRAND RAPIDS

THREAD SEALANTS DO'S AND DONT'S

Thread sealants are used in the assembly of engine and drive train components on all Kawasaki products. Fasteners with sealant are more difficult to remove than fasteners without sealant. If air tools are used, fasteners with sealant can be damaged or broken, adding time to the repair. Even if the fastener does not break, the bolt or screw can be ruined, raising the cost of the job and possibly causing a parts delay.

If you know a fastener has sealant applied, heat it before you put a wrench or driver on it. The heat loosens the sealant and won't damage the fastener. Careful use of a propane torch will work on most bolts. If a torch might cause cosmetic damage, heat an old screwdriver or socket and touch it to the head of the fastener. The heat will transfer to the fastener and soften the sealant.

Torx head bolts on Kawasaki differentials and limited slip differentials are particularly hard to remove. If you do not heat these bolts and then use an air wrench, you *will* strip the head of these bolts. They'll be difficult to remove and won't be reusable.

If you are not familiar with your repair, check the shop manual's exploded parts view at the beginning of each section. This shows which fasteners require sealant and the proper torque to use during assembly. If sealant is indicated, use caution when loosening the fastener and apply heat as needed.

Use the proper sealant and torque while assembling. Remove excess sealant from the outside of the hardware. Only the sealant on the threads is doing the job and excess sealant chips off. If these chips are in the engine oil, they can block the oil pickup screen or small oil passages that lubricate rocker arms, cam bearings, and tappets. This could lead to disastrous results.

Use sealant only when called for in the shop manual, use the right amount, clean up excess, and remove sealed fasteners carefully. Avoid trouble, do it right the first time!

Fred DeHart
201 Circle Drive N. #107
Piscataway, NJ 08854
(732) 469-1221

ATLANTA/TULSA

KIC TIPS

The more you use KIC, the more you realize it helps with more than part numbers, service bulletins and flat rates. Here's an example of how valuable KIC can be to a technician reassembling an engine, where many washers, spacers and shims look alike. It is too easy to get them in the wrong place and end up with a problem.

Let's use the KLF300 engine family for example. Because of a delay, you forgot where all the shims and washers go—KIC can help. In the parts description, KIC lists dimensions of the washers, shims, and spacers with inside and outside diameter, and thickness. Use your vernier caliper to measure the dimensions of your washer.

Open KIC in your computer, and then select the model you are working on. The first menu to pop up is the options menu. Click on "Search for Parts." This gives you the "Model/Part Search" menu. Type the word "washer" in the upper right "Description" column. KIC lists every washer used on this model. A few are shown as "plain" hardware with no dimensions.

Scroll through the list until you find a match for the size of your washer. Click on that part number and the "Selected Parts and Diagrams" menu will pop up with the part number and the area(s) where it is used, such as transmission, frame, or hub. If you are working on the transmission, click on that selection. KIC will go to that page and show the proper place(s) for that part.

KIC is the quickest place to find this information. The microfiche has it, but you must check each washer individually. The service manuals have pictures but no dimensions or part numbers. With KIC, there are only six mouse clicks and typing one word.

If you have a special KIC TIP, contact me so we can share it with everyone.

Walter Rainwater
6110 Boat Rock Blvd. S.W.
Atlanta, GA 30378
(404) 349-2000

Kawasaki and MMI Join Forces *-con't*

gram students have the opportunity to complete all of Kawasaki's Back to the Basics books and receive the corresponding certificate. The K-Tech Specialist program is a complete, well-rounded education for the entry-level technician entering the Kawasaki dealer network. For the dealership, it helps to reduce time spent training the new technician, which in turn increases time spent making a profit.

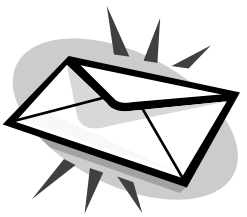
Top Tech Award

Each K-Tech Specialist class has a Top Tech award available to one student. This award has very strict criteria that must be met in order for a student to qualify. When asked how the K-Tech program helped him with his position at DDS Motorsports in Utica, N.Y., Top Tech award recipient Frank Hollenbeck replied, "There was so much the program offered that it would be difficult to pin point one particular task which helped me the most. The whole course helped me to become a better technician; everything from the in-depth suspension to learning the KIC and K-SHARE programs." Tom strongly suggests enrolling in MMI's K-Tech Specialist program for anyone interested in pursuing a career in the Kawasaki dealer network.◆

Mail Distribution

Is there a monster lurking at your dealership, desiring to pull you down into mediocrity? If the people at your dealership do not receive and/or read the critical mail sent to them, the monster is on the loose.

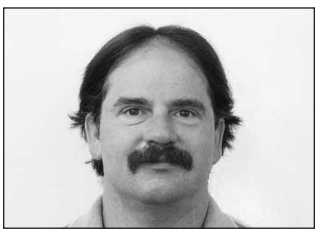
Kawasaki sends out a wealth of information including microfiche, KIC and K-Share CDs, service, sales, and parts bulletins and more. The information could be sent by USPS, UPS, or even electronically. It takes a well thought out administrative plan to make sure the right people get what they need when they need it. We realize you are especially busy right now, so a good system is essential. The busier you are, the more important good communication becomes.



Kill the monster. Train key people to open and distribute the mail to the proper departments. Copy special bulletins such as RECALLs and FDMs, then distribute a copy to each of the Sales, Service, and Parts departments immediately. Discuss important communications in weekly staff meetings.

Establish a system where each department head must initial and return a circulation sheet signifying they saw and read this important mail. Department heads need to do the same thing for their employees.◆*–John Griffin*

Regional *-con't*



IRVINE/TACOMA

WELCOME SERVICE INSTRUCTOR

I would like to say hello and introduce myself. I'm Chris Viningre. I've been in the motorcycle industry for 25 years, most of it in service.

I started in the motorcycle business in the mid-'70s attending a motorcycle repair school in Port Author, Texas. My dream was to work on motorcycles and race them, as well. Upon graduation, I took a job in Conroe, Texas, a small town just north of Houston.

In 1986, I saw an advertisement looking for motorcycle mechanics to teach others how to work on them. This sounded like fun, since I occasionally spoke in a friend's community college small engine class, about working in a motorcycle dealership. I always enjoyed doing that class, so teaching every day sounded exciting. I became an Instructor at the Motorcycle Mechanics Institute (MMI) in Phoenix.

I was promoted to a Senior Instructor working in the MMI Career and Advance departments. I taught almost 2000 students while there. I still enjoy visiting dealerships and seeing ex-students working in the industry. In 1992, I returned to Conroe, Texas to care for my father. I returned to the dealership where I got my start and later opened my own shop specializing in hi-performance.

I have always been involved in racing and have great respect for a well-tuned engine. I participated in drag racing as a rider and tuner with two first place wins, two years in a row. I also tuned a dirt track bike that helped me better understand suspension. Later, I got involved in road racing by starting an AMA 883 class race team. In March 2000, I came to Kawasaki and found a place to pass on everything I have learned in my career to others. I look forward to meeting you at a Kawasaki service school soon.◆

Chris Viningre
9950 Jeronimo Road
Irvine, CA 92618
(949) 770-0400

Mule 2510
Popping Noise in 4WD?

by Alex Dell
Product Support Specialist

There have been a number of calls to the hotline regarding KAF620-A and KAF920-A Mule 2510s with a popping noise coming from the front drivetrain in 4WD only. If you have a unit with similar symptoms, here is an explanation of the reason and likely causes:

This 4WD system was never intended to be a "full-time" 4 Wheel Drive. It is designed with the front and rear wheels geared differently (turning at slightly different speeds) in order to provide a light steering feel and maintain steering stability off road. The front wheels turn at a faster rate than the rear wheels. It is not physically possible for the front and rear wheels to turn at the same speed while in 4WD mode. This is not a problem on loose terrain. The tires can easily slip enough to accommodate these different ratios. But if the unit is used on a hard dry surface (such as pavement) *in 4wd*, the tires can't slip as easily. This puts lots of pressure on the transmission as it tries to turn at two different speeds at the same time.

The bevel gear case for the front drive has a cam damper, which can absorb some of this pressure by "winding up," but if both sets of wheels continue to turn at the same speed, something has to give. If everything in the transmission is in good shape and all the shifter cables are adjusted correctly, what finally gives is the tires do slip. But if one of the shifter cables is out of adjustment, or if an internal shifter is worn or damaged, that shifter can release the pressure by popping out and back into engagement *before* tire slippage occurs. This is the loud popping noise your customer is hearing. It usually happens predictably at regular distance intervals and only on pavement or hard-packed dirt.

The most common cause of this problem is an improperly adjusted shift cables (or the arms on the transmission shaft that the cables attach to). The following are a few things to check if you have an affected unit.

1. *With 4WD engaged, try pushing the 2WD/4WD lever (the one mounted on the transmission shift shaft) toward the cable holder. If there is movement, either the cable needs adjusting, or the lever is on the wrong spline. There should be no movement of the arm when pushed toward the cable holder. The shop manual shows the correct location for the arm under the heading 2WD/4WD Shift Mechanism Installation.*

2. *Similarly, check the Forward / Reverse cable and lever. Follow precisely the procedure in the Service Manual.*

3. *Check the HI/LOW cable and lever, making sure it shifts fully into both gear positions.*

3. *Adjust the tire pressures to the correct values. If non-standard tires have been installed, adjust the pressures to ensure that the circumference of all the tires are the same, (or that the fronts are slightly smaller).*

4. *Check the front wheels for toe-in. The service* →

Mule 2510
Popping Noise

manual says it should be 0-20mm. Our experience is that less is better than more. We recommend you adjust the toe-in to 10mm or less.

5. *If all external adjustments are correct and the problem still exists, begin your internal inspection with the cam damper assembly inside the Bevel Gear Case. There may be a loose nut reducing the spring tension.*

Follow these inspection tips in the order shown and test the unit after each change, they are numbered in order of most-to-least likely causes.

If none of the above suggestions helps, you might want to give the Hotline a call.

Note: This model was not designed as a full-time 4WD vehicle. Instruct your customers to use the 4WD mode only when poor traction conditions require it. The owner's manual also states that the 4WD mode is not to be used on paved surfaces. Tell your customers that using 4WD ***only when conditions make it necessary*** *will result in less wear and tear on the drivetrain, longer tire life and better fuel economy.*◆

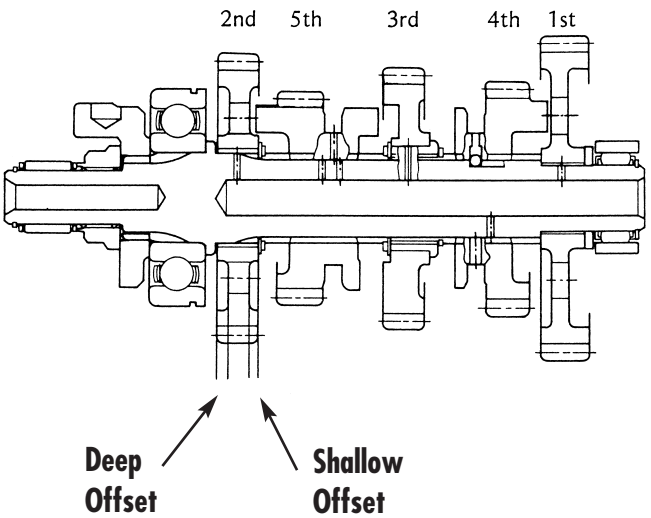
ZG1200 Voyager Jumping Out of Gear

by Gregg Thompson
Product Support Supervisor

It is possible to misassemble a ZG1200 Voyager transmission so that it will shift normally through all the gears, but won't stay in 2nd gear. We've heard of this happening when a dealer has just recently done some work on a transmission. Shortly after the customer takes delivery of the bike, it begins jumping out of 2nd gear. We've also heard of a few that actually came from the factory with the same problem.

The problem stems from the fact that 2nd gear on the output shaft can actually be installed backwards; yet everything will appear to be correct, and it will shift normally on the bench. The dog slots in the gear are slightly offset to one side. This slight offset is easy to overlook when installing the gear on the shaft. If installed backwards, the offset is just enough to cause it to jump out of gear.

The offset results in a shallow "dish" (3mm deep) on one side of the gear, and a deeper dish (5mm) on the other. The gear should be installed with the deeper (5mm) dish facing away from the slider and toward the ball bearing (see the drawing). All this information is in the service manual.◆



The OSHA Inspector Is Here
by David Behlings

We want to give you one less thing to worry about when hearing the words "the OSHA inspector is here." As you may remember, last year we released a Materials Data Safety Sheets (MSDS) CD-ROM. If you would prefer a binder with paper sheets in addition to your CD-ROM, a new version is now available. We just updated the MSDS paper materials with close to 100 revisions and over 100 additional products.

MSDS Supplies:
MSDS pages only: No Charge
MSDS pages in a bright 3" yellow binder with index and tabs $25.00
MSDS CD-ROM: $10.00 for additional CDs

For MSDS materials:
Phone (949) 770-0400 Ext. 2452,
Fax (949) 460-5629 Attn: MSDS

Toll Free Accessory Assistance
by Rick Roddewig

Did you know the Kawasaki Accessories department has a (**dealer only**) toll free number for assistance and information on accessories? It's 1(877) 422-2457, or you might remember it more easily as 1-877 4 ACC HLP. Some of the things you might call for could include:

Missing or incomplete instructions
Missing parts in a kit
Fitment questions or problems
Obtaining individual replacement parts for an assembly or kit

If your problem requires it, you can be referred to an accessories technician who has experience in the design, testing and installation of that accessory. By calling them you not only get your questions answered, but you give them valuable feedback on their product.

Remember that this is a dealer only number. Please don't give it to your customers.◆

2000 Kawasaki Model Oil Filters

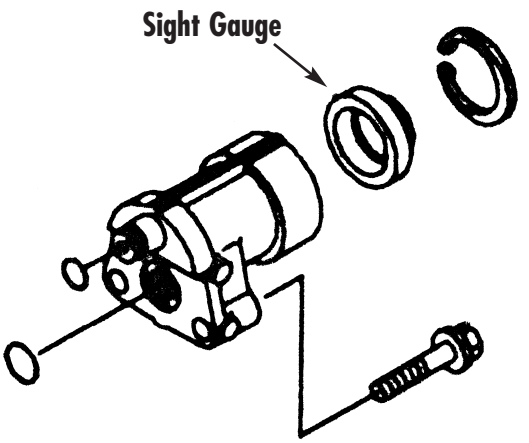
This list was created using KIC. To find the same information, look up a particular model's oil filter. Go to the "View Part Information" screen, and then click on "Where used on any model." It will list each model that the part fits. If you click on one of the models listed, it will show that model's parts diagram with the part highlighted.

You can print your list of models by going to the Menu bar, clicking on "File," then scroll down to "Print Pop Up Window" and stop. "To the Printer" should pop up. Click on it to send the list to the printer. Try this on part number 16097-1063 (it is used on 72 models).◆—*by David Behlings, Parts Data Coordinator*

16097-1063	16097-1066	16097-1067	16099-003	16099-004	52010-1053	16097-1068	16097-1070	49065-2071	16097-1069
KVF300-A2	EN500-C5	ZX600-J1	EX250-F14	KLF220-A13	KL250-G2	EJ650-A2	ZX1200-A1	KAF300-C4	KAF950-A1
KVF300-B2	EX500-D6	ZX900-E1	ZR750-F2	KSF250-A14	KLX300-A5			KAF300-D1	
KVF400-C2	VN750-A16		KZ1000-P19	KEF300-A6				KAF620-A6	
KVF400-D2			ZG1000-A15	KLF300-B13				KAF620-B6	
ZX600-E8			ZR1100-C4	KLF300-C12				KAF620-C6	
ZX750-P5			ZX1100-D8	KL250-D17					
VN800-A6			ZG1200-B14	KL650-A14					
VN800-B5									
VN800-C2									
VN1500-E3									
VN1500-G2A									
VN1500-J2									
VN1500-L1									
VN1500-N1									

ZX-12R Oil Level Inspection

by Gregg Thompson
Product Support Supervisor



Be aware of this: The new ZX-12R can fool you into adding too much oil during an oil change if you're not careful. On this model the Oil Level Gauge (or sight glass) is located in a small cylinder that is bolted to the crankcase below the clutch cover, instead of *in* the clutch cover like on most Kawasaki 4-stroke engines. This cylinder has two small passages in it, which allow the oil to flow into the gauge from the crankcase.

The problem is that while the engine is being filled with oil, an air bubble can get trapped in the gauge. With the bike upright or on the sidestand, this air bubble cannot escape no matter how much oil is put in the engine. The air bubble gives the appearance that the engine is not quite full yet. Experienced technicians have been known to put a quart or more too much oil in the engine while diligently checking the oil level in the sight glass.

We suggest you put the recommended *quantity* of oil (or slightly less) in the engine, run it (and even tip the bike to the right one time), and then check the oil level after giving the cool oil a minute to drain down. Be aware that overfilling this engine with oil can significantly reduce the power output! The greater the over-fill, the greater the power loss. If after running the engine, you cannot see the top of the oil in the gauge, you should drain some oil out until you can see the oil level.◆

Crank Bearings—Order Them All

by Nate DePauw
Order Services Coordinator

When replacing a crankshaft, you must achieve the correct journal tolerances as indicated in the service manual. Since you probably don't stock cranks, cases, rods, or new two piece plain bearings (bushings), you have two options.

1. *Wait for the parts to arrive, then order the correct plain bearings as indicated by the chart in the service manual. This adds down time to the repair.*
2. *Order each color bushing in sufficient quantities at the same time you order the crankshaft and/or engine cases. This makes certain you have the correct size when assembling the motor.*

Option one takes too long for good customer service. Option two is easier and quicker, but you don't want to get stuck with extra parts. Kawasaki has a special return policy for this exact circumstance.

Go ahead and order all the different bushings needed to complete the job and return the other bushings (in unopened, resalable condition). Kawasaki waives the normal part return handling charge of 15% in consideration. When filing your Request for Credit, either through K-Share or paper form, type in the dealer comment section "Bushing return," then submit it to Kawasaki.

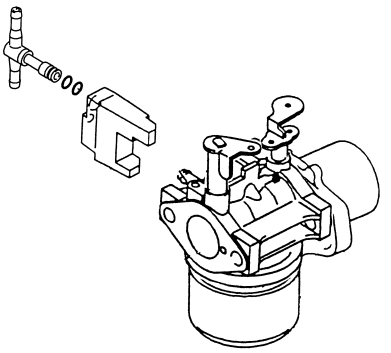
Tip – Before this repair watch the video, Kawasaki Servicing and Selecting Plain Bearings.◆

Carburetor Heater "Grease"

by Gregg Thompson
Product Support Supervisor

Some Kawasaki vehicles come equipped with a coolant-type carburetor warmer. These carburetor warmers have a T-shaped fitting that is installed in the carburetor body. Warm engine coolant is route through this fitting to heat the carburetor. On the KAF620-A, B and C Mule carburetors, an additional fitting called a "holder" is used. It is an aluminum block, which mounts to the carburetor body and simply provides a place to install the "T" fitting.

A special *heat-conductive* compound is used on these fittings to help transfer heat to the carburetor body. On the Mule engines, the compound is used on both the "T" fitting and the "holder." This compound appears to be just white grease, but it's more than that. Common grease will not do the same job. Unfortunately we do not publish this part number on the parts microfiche anywhere. The part number is 92137-1002. Order some for your shop now. Then write down the P/N someplace where you'll be able to find it the next time you need to order some.◆



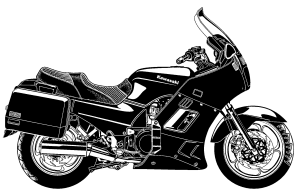
Zero Oil Pressure?

Several years ago, we ran an article about strange oil pressure problems on EN450/500s and EX500s. For reasons we're not sure of, the engines would sometimes have zero oil pressure after the engine oil had been drained and refilled for an engine repair or just an oil change. In fact, this would sometimes happen on the first start-up during the pre-delivery service. There have been a number of theories about why this happens, but the most likely is that the oil pump has lost it's prime and can't draw the oil up the pick up tube.

Since that article was written, this phenomenon has occurred on other models, such as VN750s, ZX-6R and even the new ZX-12R. It's always the same story, the engine has been drained of all oil and refilled, and on restart the oil light won't go out! Luckily a quick fix has been found that usually solves the problem immediately. Simply loosen the spin-on oil filter enough so that there is no pressure on the gasket. Start the engine and be ready to tighten the filter as soon as oil flows. It will come gushing from the filter. If oil doesn't flow within a few seconds, it's not going to, but this trick almost always works.◆—*Gregg Thompson*

Windshield Cracking

by Alex Dell
Product Support Specialist



We have been receiving an increasing number of reports of cracks in OEM windshields. The cracks generally originate at the mounting holes and radiate outwards. There are a few possible explanations for this phenomenon. The first and most obvious possibility is that the fasteners were simply overtightened creating too much pressure and rigidity at the mounting points. The hardware for our fairing-mounted windshields is designed to hold without being tightened like conventional hardware. "Snug" is good enough.

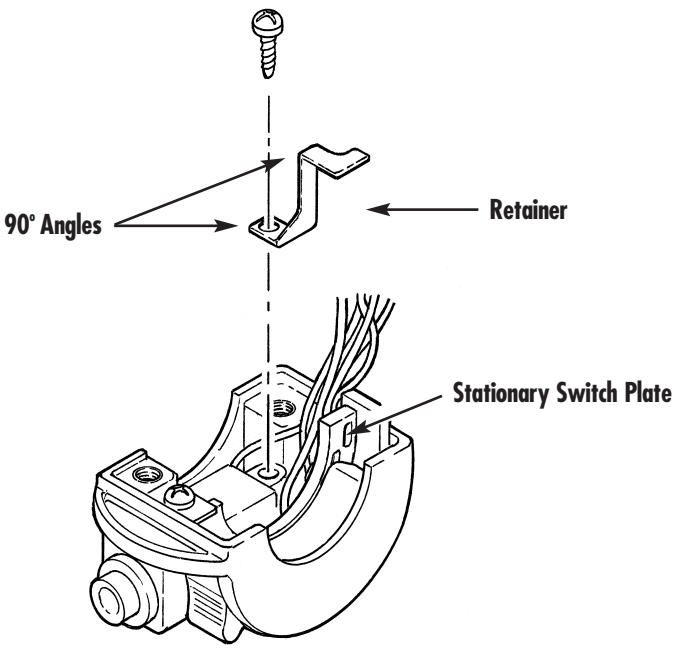
A second and less obvious possible cause is that a conventional thread-locking agent was applied to the mounting fasteners on assembly. The chemicals in those products will react with the plastic and cause cracking…every time!

And finally the most likely explanation is that the screen is being cleaned with aerosol cleaners or conventional polishes. The chemicals used in these products can also react with the plastic to cause cracking at the mounting holes (or other places on the windshield). In some cases, products that can react with these windshields actually state that they are safe to use on plastics. Be sure to advise customers that they should only clean their windshields with pure water or a mild soapy water solution.

Note: For the same reason, never use conventional locking agents on fairing mounting screws either. Kawasaki Accessories carries a Three Bond thread locker for plastics (part number 1401), which can be used to lock fairing and windshield screws without causing the plastic to crack.◆

Melted Prairie Headlight Shells

In the Fall '98 issue of *K-Tech News* we ran an article about possible headlight high beam problems on the KVF300A/B and the KVF400C/D Prairie ATVs. A problem inside the handlebar switch may cause the high beam not to operate. Since then we have discovered that the same problem in the handlebar switch can also result in a different symptom. The high and low beams can come on at the same time resulting in melted headlight shells. If you run into a unit with melted headlight shells (probably both), inspect the handlebar switch as follows:



1. Remove the 2 switch case screws.

2. Open the case and inspect the stationary headlight switch contact plate. It's the one with the 5 red wires soldered to it. The contact plate may be rotated out of its normal position, resulting in both beams making contact at the same time. If the contact plate has rotated, its (gold colored) retainer will be bent out of position as well.

3. Bend the retainer back to its correct shape: straight, with 90˚ angles at each end. Remove the retainer to straighten it. Push the switch contact plate back into position and install the reshaped retainer plate.

4. Untwist the wire bundle that goes to the upper switch case before installing the retainer. This will provide more slack in the wires to prevent bending the retainer again.

5. Install the switch assembly back onto the handlebars. Be careful not to pinch the untwisted wires! Test the headlights.◆—*Ed.*

A&P Oddities

Maybe you have noticed that Assembly and Preparation instructions sometimes include items for markets other than the U.S. The A&P Manuals and Sheets that we get here are used all over the world. They must contain everything needed to assemble and prepare the model no matter where in the world it is being sold. For instance, on page 23 of the MULE 2510 Diesel A&P (99931-1362-01), there are installation instructions for a reverse light under the rear of the bed. The American market model does not have this feature, only the model for Europe. Differences like this are often due to varying government regulations.

Another A&P note: The ZX-12R A&P manual lists the fuel octane requirement as 95. This is the Research Octane Number. It equates to 90 octane on the Antiknock Index, which is the number you see on pumps in the U.S.◆—*Ray St. John*

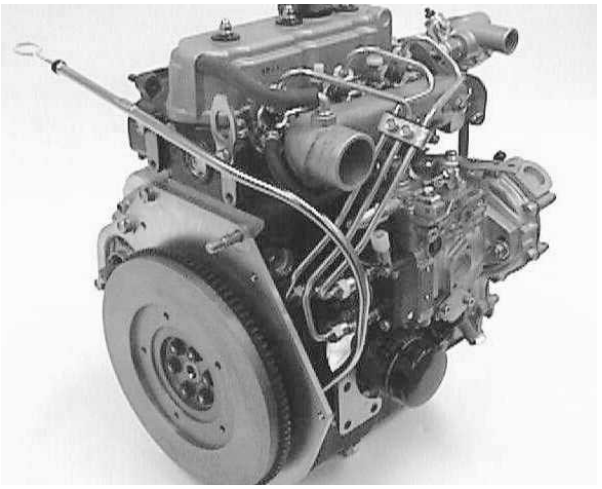
ZX-12R Spark Plug Replacement

We've had a few people call the hotline and ask the question, "Can you replace the spark plugs on a ZX-12R without pulling the engine?" Yes, you can. You just need to have a spark plug socket, the correct length extension and nimble fingers. There are a bunch of wire connectors on the left side of the cylinder head and the fast idle cable on the right side that should be disconnected to make room. Remove the rubber cover from on top of the stick coils and disconnect and remove the stick coils.

Once the coils are out of the way, drop the spark plug socket down the hole. Then put the extension down the hole and push it into the socket and the socket onto the plug. When you've unscrewed the plug, lift the extension high enough to grab the top of the socket and separate them. If you drop the socket, you'll have to fish it back out with the extension. It's a little tricky but doable.

By the way, spark plug inspection is not required at the first service.◆ —*Ed.*

Diesel Mule Engines Available



Kawasaki now has KAF950-A1 diesel Mule engine assemblies available from the parts department. As you can imagine, these engines are not cheap (diesel engines never are). But they have been made available for customers to purchase.

Do not order one of these engines for warranty repairs. They are not intended for that purpose, and you could end up stuck with the (very large) bill. For major engine repairs under warranty always consult the Hotline.

These engine assemblies are very complete. They come with exhaust and intake manifolds, the complete fuel injection system, the starter motor, and the alternator and belt. The part number is 59341-1051.◆—*Ed.*

Tool Corner

Incorrect Special Tool Part Number

The ZR1100-C3 service manual (P/N 99924-1196-02) lists an incorrect part number for the fork cylinder holder required to disassemble the front fork. The service manual lists P/N 57001-1297, which supersedes to 57001-1396. The correct part number for the cylinder holder is 57001-1406.

New Tool for the ZX-12R

A one-piece piston holder is now available for the ZX1200-A1. The holder (P/N 57001-1459) is placed under the pistons during cylinder installation.◆—*Rob Taylor*

W650 *-Cont'd*

driving the camshaft. There is no cam chain, tensioner, or guides. A set of hypoid bevel gears (with curved teeth) on the crankshaft turn a propeller shaft running vertically up the right side of the cylinder. Another pair of hypoid bevel gears connect the propeller shaft to the camshaft. The complete assembly is oiled by the engine's lubrication system.

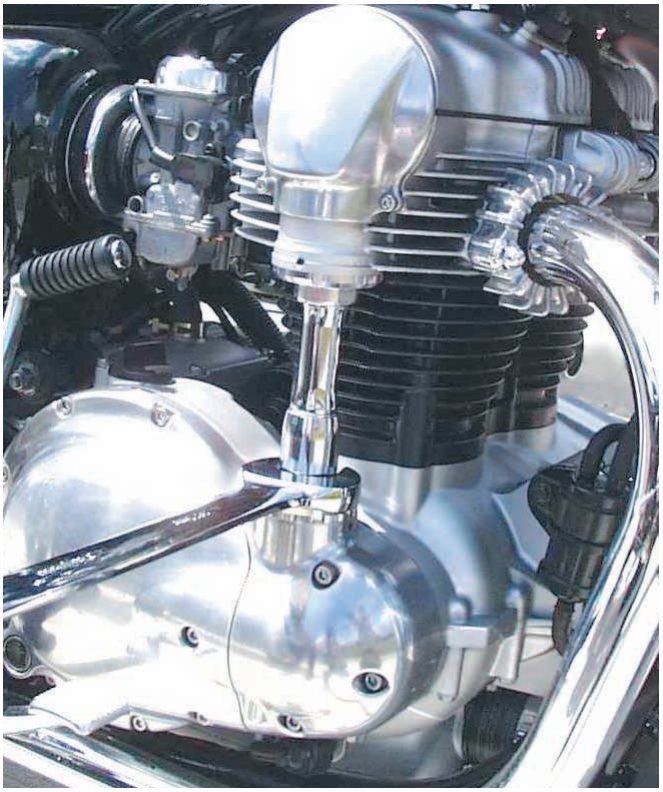
Service News

A valve clearance inspection is required every 7500 miles. It is not inspected at the first 600 mile service. To adjust the clearance just slide the rocker arms over (like on the ZX-11) and replace the shim which rests on the spring retainer. The shims are the same size as the current ZX-6, 6R, 7R, 9R, and KLX300R.

Valve Clearance	
Intake	0.08 – 0.13mm
Exhaust	0.14 – 0.19mm

Servicing the bevel gear cam drive system should be unnecessary unless major components are replaced. As usual, shims are used to space the gears riding on the horizontal shafts for proper heel and toe engagement. The news is that the vertical shaft runs in a telescoping case with adjustable gear cases so its two gears have no shims but are adjusted by threading the desired gear case in or out. The amount of rotation is strictly limited since too much adjustment will damage the gears.

If a repair has been made and there is excessive gear whine or gear lash noise it should be readjusted. Note: gear whine reduces (and gear lash increases) as the engine warms up, so check this setting only with a warm engine.



The gear lash of the bevel gear cam drive system can be altered by adjusting the upper or lower (pictured) gear case.

Chassis

The chassis is fairly standard with the exception of a square tube backbone for added rigidity. The swingarm uses nice oval tubing with block-type chain adjusters like the race bikes. The short 57-inch wheelbase and a wide handlebar make this motorcycle a surprisingly responsive handler. A big 300mm semi-floating disc with a twin-piston caliper offer braking capabilities from this decade.

Standard features include a center stand and a backup kick start lever. An electronic speedometer is driven off the countershaft sprocket nut. It has an LCD odometer, trip meter, and clock. An electronic tachometer is included in the gauge panel.

The W650 is a rolling styling exercise with a surprise. The surprise is how much fun the bike is to ride. How well it runs, handles, sounds, and in general puts a smile on your face. It attracts attention wherever it goes. In this day of hyperbikes, there is still room for a bike that is fun to ride and does it all with style and grace.◆